WHAT WE CLAIM IS:

1. An apparatus for processing received spread spectrum signals modulated with a unique pseudo-random code, comprising:

a plurality of channel modules each including a correlator;

means for hierarchically chaining a plurality of the channel modules in series, the means including a selector for selecting one channel module from at least two candidate channel modules for the next channel module of the chain.

2. The apparatus according to claim 1, wherein code and/or control signals and/or carrier signals are passed from one channel module of the chain to the next, further comprising: a selector for selecting to transmit the code and/or control signals and/or carrier signals to each next channel module with a delay or without a delay.

3. An apparatus for processing received spread spectrum signals modulated with a unique pseudo-random code, comprising:

a plurality of channel modules each including a correlator;

means for hierarchically chaining a plurality of the channel modules in series, code and/or control signals and/or carrier signals being passed from one channel module of the chain to the next; and

a selector for selecting to transmit the code and/or control signals and/or carrier signals to the next channel module in the chain with a delay or without a delay.

4. An apparatus for tracking received spread spectrum signals modulated with a unique pseudo-random code and for obtaining a correlation profile, comprising:

a generator for generating a first replica of the pseudo-random code;

a first demodulator for sequentially demodulating the received spread spectrum signals with the replica of the pseudo-random code at regular time intervals;

a first integrator for integrating the output of the first demodulator;

a second generator for generating a plurality of second versions of the first locally generated replica of the pseudo-random code, each second version having, in any one time interval, a selectably different timing compared with the timing of the first

replica;

a second demodulator for sequentially demodulating the received spread spectrum signal at regular integration time intervals with different ones of the second versions of the first replica and outputting the results; and

a second single integrator for integrating each output of the second demodulator separately.

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5. The apparatus according to claim 4, wherein the first and second generators ~~are provided by:~~ Comprising

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a third generator for generating a third replica of the pseudo-random code;

a delay line, to which the output of the third generator is applied, the delay line having a plurality of taps wherefrom the ~~third~~ pseudo-random code replica is available at different relative timings thereof;

the output of one tap of the delay line being the output of the first generator;

the second generator being provided by a selector connected to second outputs of the plurality of taps of the delay line with advanced timing compared to the one tap, the selector being adapted to sequentially select different ones of the second outputs at predetermined times as second versions of the first replica of the pseudo-random code.

6. An apparatus for despreading received spread spectrum signals, at least a part of the received signals being modulated with a first unique coarse acquisition pseudo-random code and a second precision unique pseudo-random code; comprising:

a first plurality of correlators,

a second plurality of correlators; and

a switching device for switching any one of the first plurality of correlators to correlate the received spread spectrum signals with respect to one of the first and second unique pseudo-random codes.

7. An apparatus for despreading received spread spectrum signals at least a part of the received signals being modulated with a first unique coarse acquisition pseudo-random code and a second precision unique pseudo-random code; comprising:

a demodulator for demodulating the received spread spectrum signals with a

replica of the first pseudo-random code;

a first integrator for integrating the result from the demodulator and for dumping the integrated value at the chip rate of the first pseudo-random code or a multiple thereof;

a second integrator for integrating the results from the first integrator over a time period longer than the integration period of the first integrator.

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8. An apparatus for processing L1 and L2 spread spectrum signals received from at least one satellite of a global positioning system, wherein each of the spread spectrum signals includes a unique frequency carrier with a known pseudo-random known code modulated thereon, comprising:

a generator for generating a single replica of the known code;

a delay line connected to the generator, the delay line having a plurality of taps wherefrom the known code replica is available at different relative phases thereof;

a first demodulator connected to the generator for demodulating one of the received L1 and L2 signals with the single replica of the known code without any substantial delay;

a second demodulator selectably connectable to any one of the taps of the delay line for demodulating the other of the received L1 and L2 signals with a delayed replica of the known code, and

a switch for selectably switching the other of the received L1 and l2 signals for demodulation by the ~~first~~ second demodulator, and to switch the one of the received L1 and L2 signals for demodulation by the ~~second~~ first demodulator.

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9. An apparatus for processing L1 and L2 spread spectrum signals received from at least one satellite of a global positioning system, wherein each of the spread spectrum signals includes a unique frequency carrier with a known pseudo-random P-code and an unknown code modulated thereon, comprising:

a generator of replicas of the known P-code;

a first demodulator connected to the generator for demodulating one of the received L1 and L2 signals with a replica of the P-code;

a second demodulator for demodulating the other of the received L1 and L2

signals with a replica of the P-code;

a first integrator for repetitively and separately integrating the demodulated one of the L1 and L2 signals over time periods related to the unknown code;

a second integrator for repetitively and separately integrating the demodulated other of the L1 and L2 signals over time periods related to the unknown code;

a correlator for correlating a result of the integration step from each of the two L1 and L2 signal paths with the integrated signal of the other of the L1 and L2 signal paths; and a phase adjuster for adjusting the phases of the locally generated P-code replicas relative to the incoming L1 and L2 signals in order to maximize the power of the correlated L1 and L2 signals, wherein the correlator includes: not so

not fig 13 shows only the Q output

a comparator for comparing the absolute value of the integrated demodulated L1 and L2 signals;

not shown

a combiner for individually combining the values of the integrated demodulated L1 and L2 signals with a unitary value having the sign of the integrated demodulated L1 and L2 signals having the largest value as output by the comparator; ~~and~~ wherein the integrator includes:

a first accumulator for accumulating individually and separately the outputs of the combiner for the demodulated one of the L1 and L2 signals; and

a second accumulator for accumulating individually and separately the outputs of the combiner for the demodulated other of the L1 and L2 signals.

10. The apparatus according to claim 9, wherein the combiner is a multiplier.

11. A method of processing received spread spectrum signals using a plurality of channel modules each including a correlator, comprising at least one of the following steps:

selecting one of two further modules to include within a chain of a plurality of channel modules;

selecting to transmit code and/or control and/or carrier signals to the next channel module in a chain of a plurality of channel modules with or without delay.

12. A method for tracking received spread spectrum signals modulated with a unique pseudo-random code to obtain a correlation profile, comprising the steps of:

generating a first locally generated replica of the pseudo-random code;

sequentially demodulating the received spread spectrum signals with the first locally generated replica of the pseudo-random code at regular time intervals and integrating the result of each demodulation step in a first integration step using a first integrator;

generating a plurality of second versions of the first locally generated replica of the pseudo-random code, each second version having a selectably different timing compared with the timing of the first replica in any one time interval;

sequentially demodulating the received spread spectrum signal with different ones of the second versions of the first replica at regular time intervals and integrating each demodulation result separately in second integrating steps using a single second integrator.

13. The method according to claim 12, wherein the generating step includes:

applying a third replica of the pseudo-random code to a delay line having a plurality of taps wherefrom the third pseudo-random code replica is available at different relative timings thereof;

using a first output from a first one of the taps of the delay line as the first replica;

sequentially selecting at predetermined times different second ones of the outputs from the plurality of taps with different timing compared to the timing of the first one tap as the second versions of the pseudo-random code.

14. A method for despreading received spread spectrum signals, at least a part of the received signals being modulated with a first unique coarse acquisition pseudo-random code and a second precision unique pseudo-random code using a first plurality of correlators and a second plurality of correlators, the method comprising the steps of:

selecting for any one of the first plurality of correlators so that this correlator correlates the received spread spectrum signals with respect to one of the first and second unique pseudo-random codes.

15. A method for despreading received spread spectrum signals at least a part of the

received signals being modulated with a first unique coarse acquisition pseudo-random code and a second precision unique pseudo-random code; comprising the steps of:

demodulating the received spread spectrum signals with a replica of the first pseudo-random code;

integrating the result of the demodulation, the integrating step including the steps of:

integrating the result from the demodulator in a first integrator and dumping the integrated value at the chip rate of the first pseudo-random code or a multiple thereof to a second integrator; and

integrating the results from the first integrator in a second integrator over a time period longer than the integration period of the first integrator.

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16. A method of processing L1 and L2 spread spectrum signals received from at least one satellite of a global positioning system, wherein each of the signals includes a unique frequency carrier with a known pseudo-random code modulated thereon, comprising the steps of:

locally generating a single replica of the known code;

applying the single replica of the known code to a delay line having a plurality of taps wherefrom the code replica is available at different relative phases thereof;

demodulating one of the received L1 and L2 signals with the single replica of the known code without any substantial delay;

demodulating the other of the received L1 and L2 signals with the generated replica of the known code from one of the taps of the delay line, and

switching the demodulation using the not substantially delayed single replica of the known code to the ~~other~~ one of the received L1 and L2 signals and demodulating the ~~one~~ other of the received L1 and L2 signals with a generated replica of the known code from one of the taps of the delay line.

17. The method according to claim 16, further comprising the steps of:

repetitively and separately integrating the demodulated L1 and L2 signals over a time period;

adjusting the phases of the locally generated code replicas relative to the

incoming L1 and L2 signals in order to maximize the power of the integrated demodulated L1 and L2 signals, whereby the resulting locally generated code phases are useable to determine information of the location of the receiving position with high accuracy.

18. The method according to claim 17, wherein the demodulating step includes the steps of:

demodulating sequentially the other of the received L1 and L2 signals with a plurality of generated replicas of the known code from different taps of the delay line; and if no suitable maximum power is obtained from the adjusting step:

switching the demodulation with the not substantially delayed single replica of the known code to the other of the received L1 and L2 signals and demodulating the one of the received L1 and L2 signals with a generated replica of the known code from one of the taps of the delay line.

19. The method according to claim 17, wherein the frequency carriers are also modulated with an unknown code and the phase adjustment step includes correlating a result of the integration step from each of the two L1 and L2 signal paths with the integrated signal of the other of the L1 and L2 signal paths; and

adjusting the phases of the locally generated known code replicas relative to the incoming L1 and L2 signals in order to maximize the power of the correlated L1 and L2 signals, whereby the resulting locally generated known code phases are useable to determine information of the location of the receiving position with high accuracy.

20. A method of processing L1 and L2 spread spectrum signals, the received signals being received from at least one satellite of a global positioning system, wherein each of the signals includes a unique frequency carrier with a known pseudo-random P-code and an unknown code modulated thereon, comprising the steps of:

locally generating replicas of the known P-code;

demodulating the received L1 and L2 signals with replicas of the P-code;

repetitively and separately integrating the demodulated L1 and L2 signals over time periods related to the unknown code;

correlating a result of the integration step from each of the two L1 and L2 signal paths with the integrated signal of the other of the L1 and L2 signal paths; and

adjusting the phases of the locally generated P-code replicas relative to the incoming L1 and L2 signals in order to maximize the power of the correlated L1 and L2 signals, whereby the resulting locally generated P-code phases are useable to determine information of the location of the receiving position with high accuracy, wherein the correlating step includes:

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comparing the absolute value of the integrated demodulated L1 and L2 signals;

individually combining the values of the integrated demodulated L1 and L2 signals with a unitary value having the sign of the integrated demodulated L1 and L2 signals having the largest value as determined in the comparing step; and

accumulating individually and separately the results of the combining step.

21. The method according to claim 20, wherein the combining step is a multiplying step.